

RPi-DAC SingleStereo DAC rev. 6

solder **all LDOs** with 1m and 47m (on In and Out) **first**, check voltages before soldering other parts

solder all other parts, excluding the active components such as OpAmp, PCM1794A and TPA6120A

measure again all voltages: 2x +15V, 2x -15V, 1x6V, 1x3.3V

if all OK, solder OpAmp, PCM1794A and TPA6120A

power always all rails, esp. the + and -15V, **never power just one rail**

Solder Options:

if fed with DC: the BRECT and electrolyte caps are not needed: use 0R instead of BRECT

not all 47m (or 1m) Cb are needed, some can be omitted

For I/V converter (4x OpAmp) use OPA827 or LME49990

the LEDs (as indicators for the power rails) plus R can be optional

the jumper headers and jumpers can be fix soldered as 0R

the OSC (XTAL) is not used or needed, just if external FPGA or other components

some Cb (1206) as 47m/25V can be also changed to 68m/10V (depends on which rail used)

all Cb (0603) without value mentioned can be 0.1m or 1m (ATT: one 1m used on LDOs)

Improvements:

Use metal film resistors if located in signal path (825R, 1K, 1.5K, 10R)

Use NPO/CG0 caps (5.6n) if in signal path

Use OPA827 instead of LME49990 for I/V converter (JFET, but higher noise and THD)

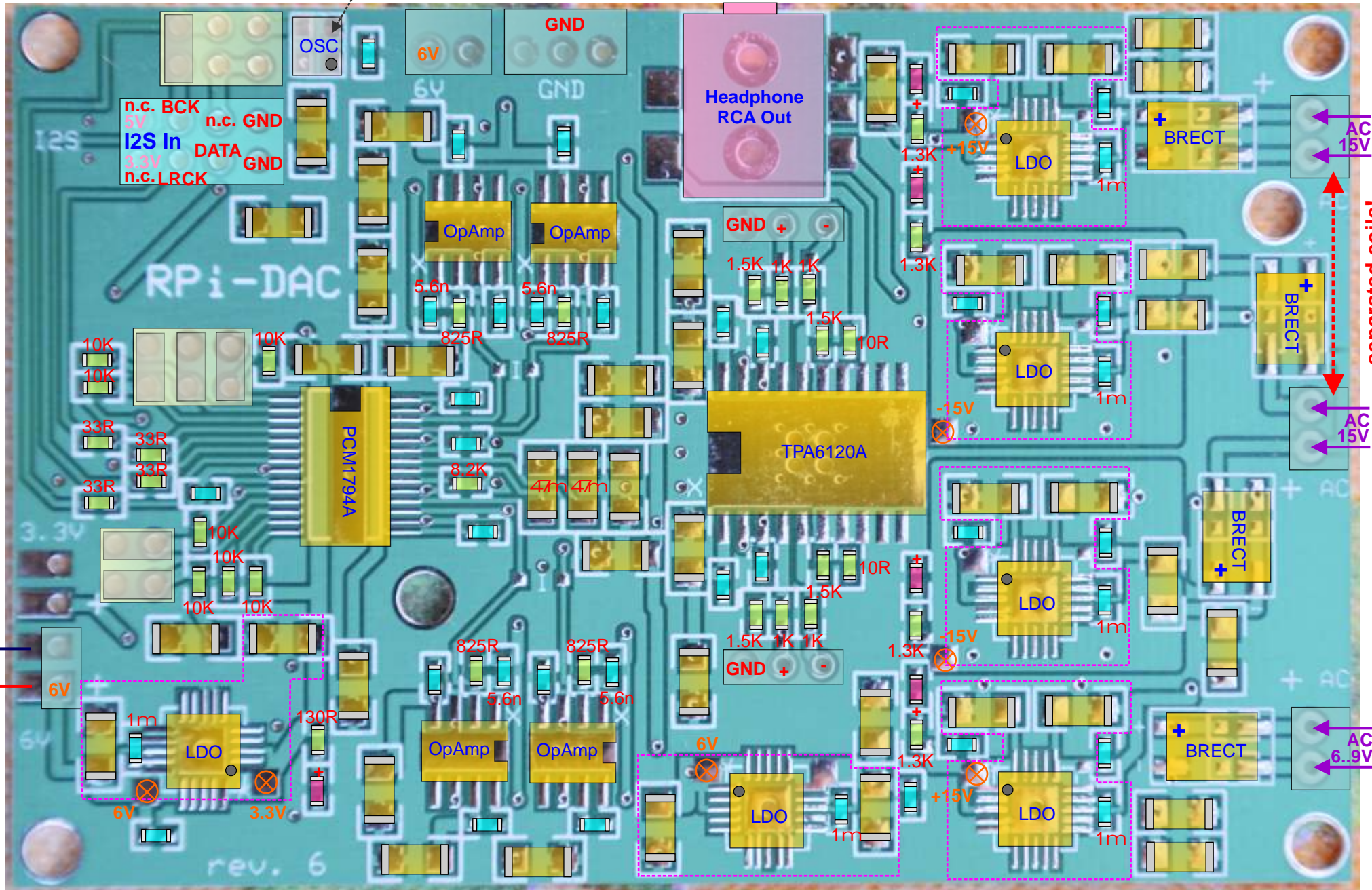
Attention:

Use AC or DC in for the +15 and -15V rail without any common center tap (with separated coils), no common connection between both!

RPi-DAC SingleStereo Top

- C (0603)
- R (0603)
- Cb (1206)
47n/25V
- male header + jumper
- LED (0603)
- Cb (0603) 0.1..1m
- male connector
- female connector

optional

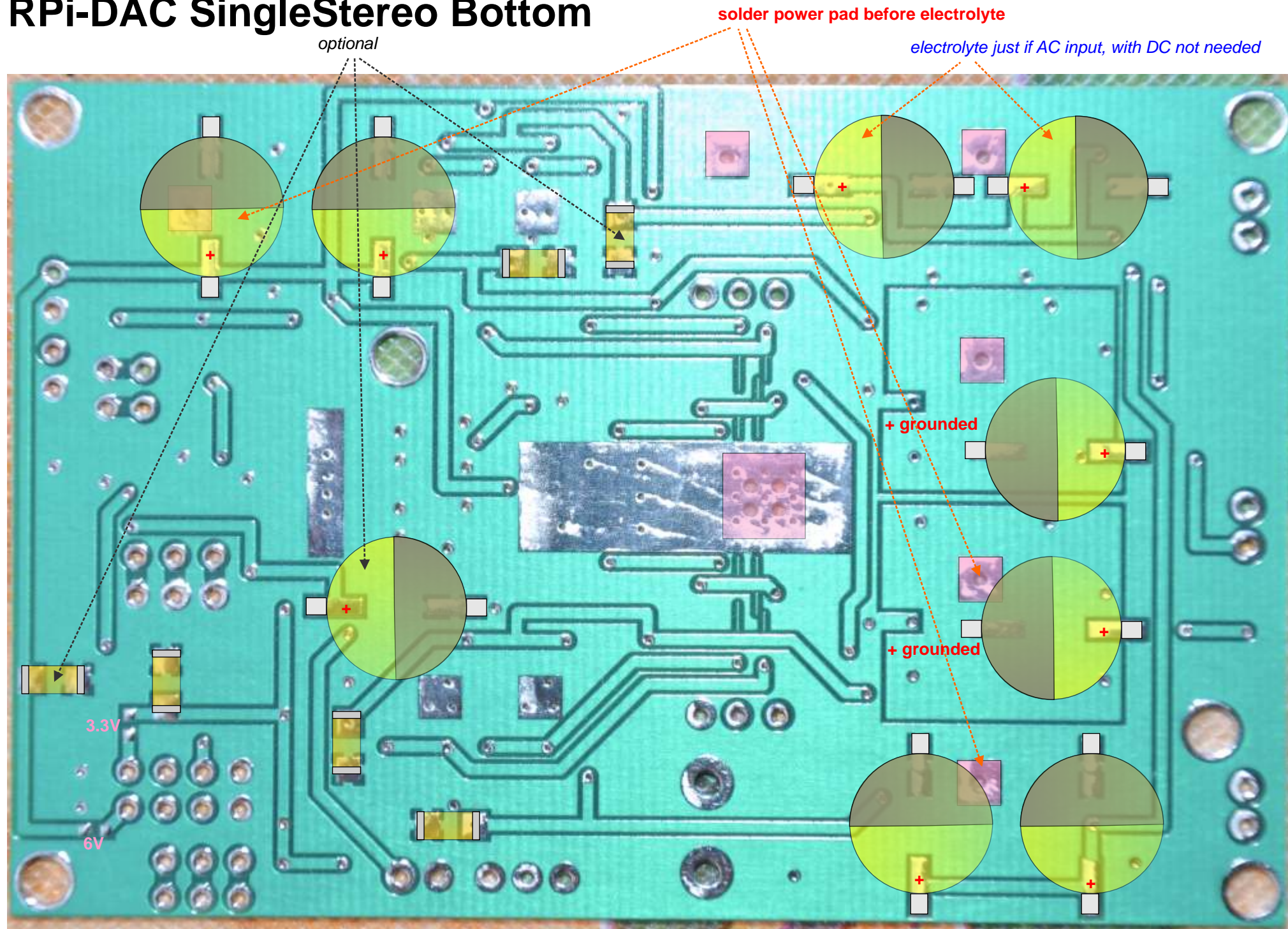


OpAmp: **OPA827** or **LME49990**
LDO : **TPS7A4700**

 solder LDO first and measure voltage

ACs in for the +15 and -15V rails have to come from separated coils, no center tap, no common GND or connection!

RPi-DAC SingleStereo Bottom

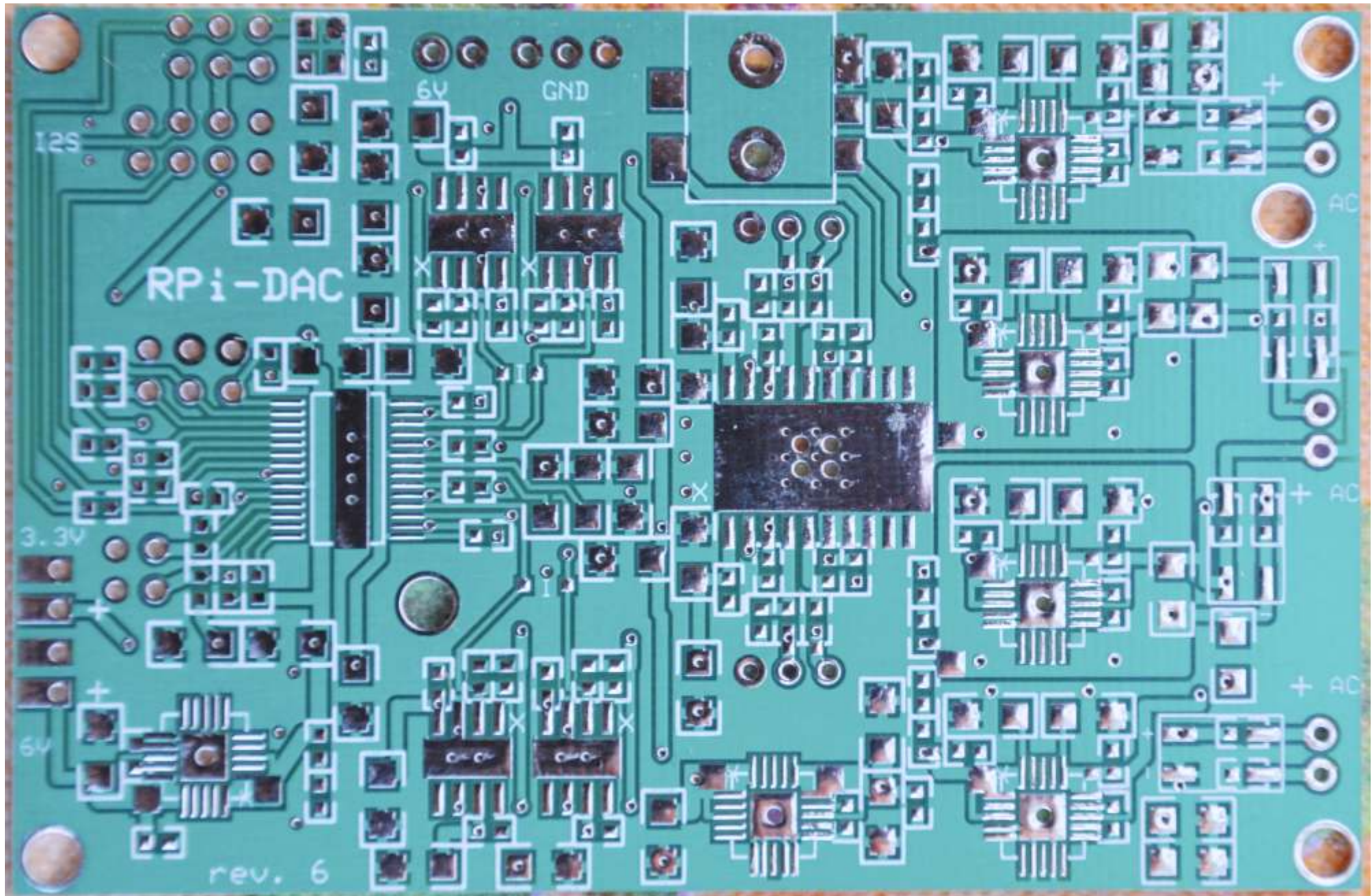


RPI-DAC BOM rev.6

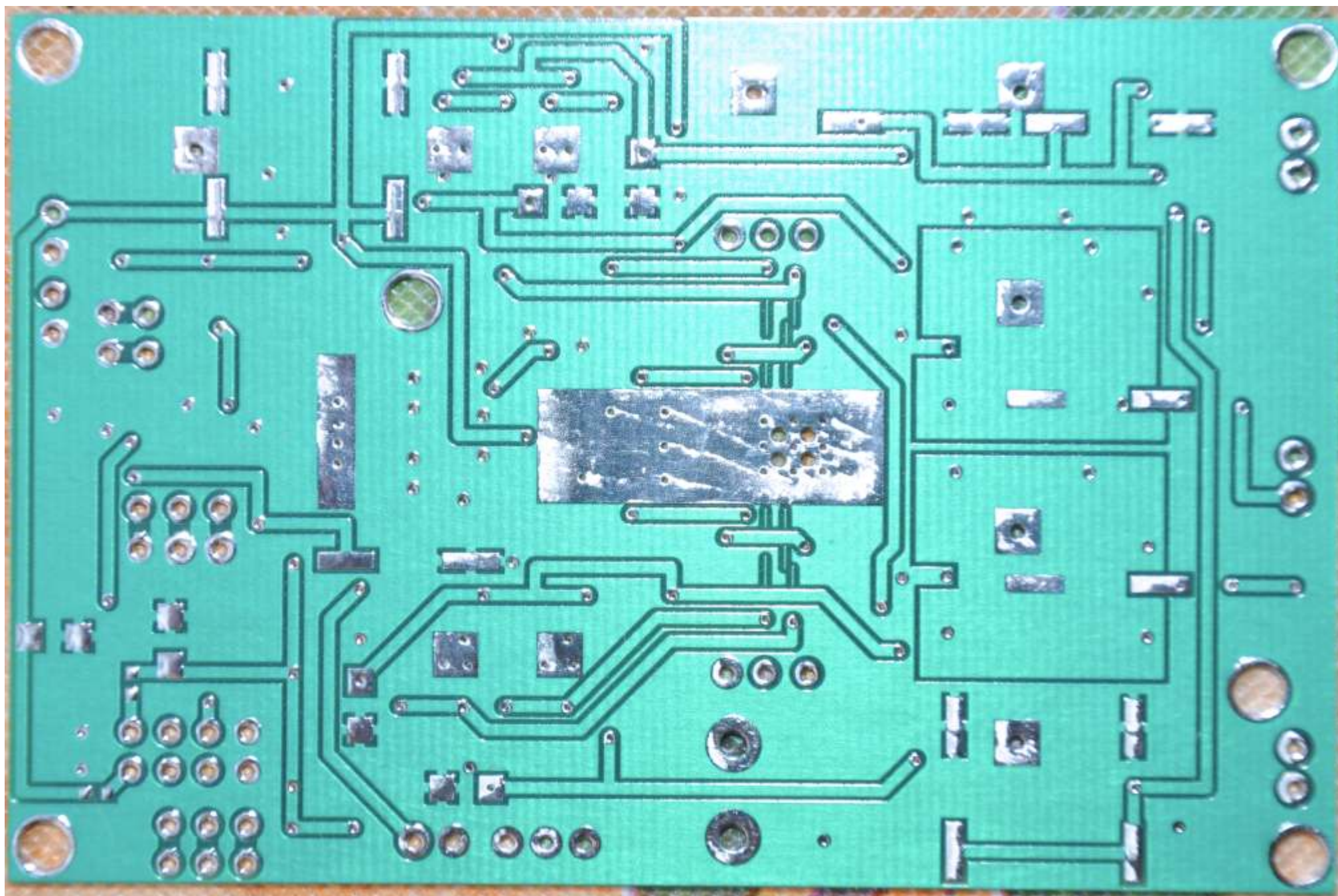
blue: optional

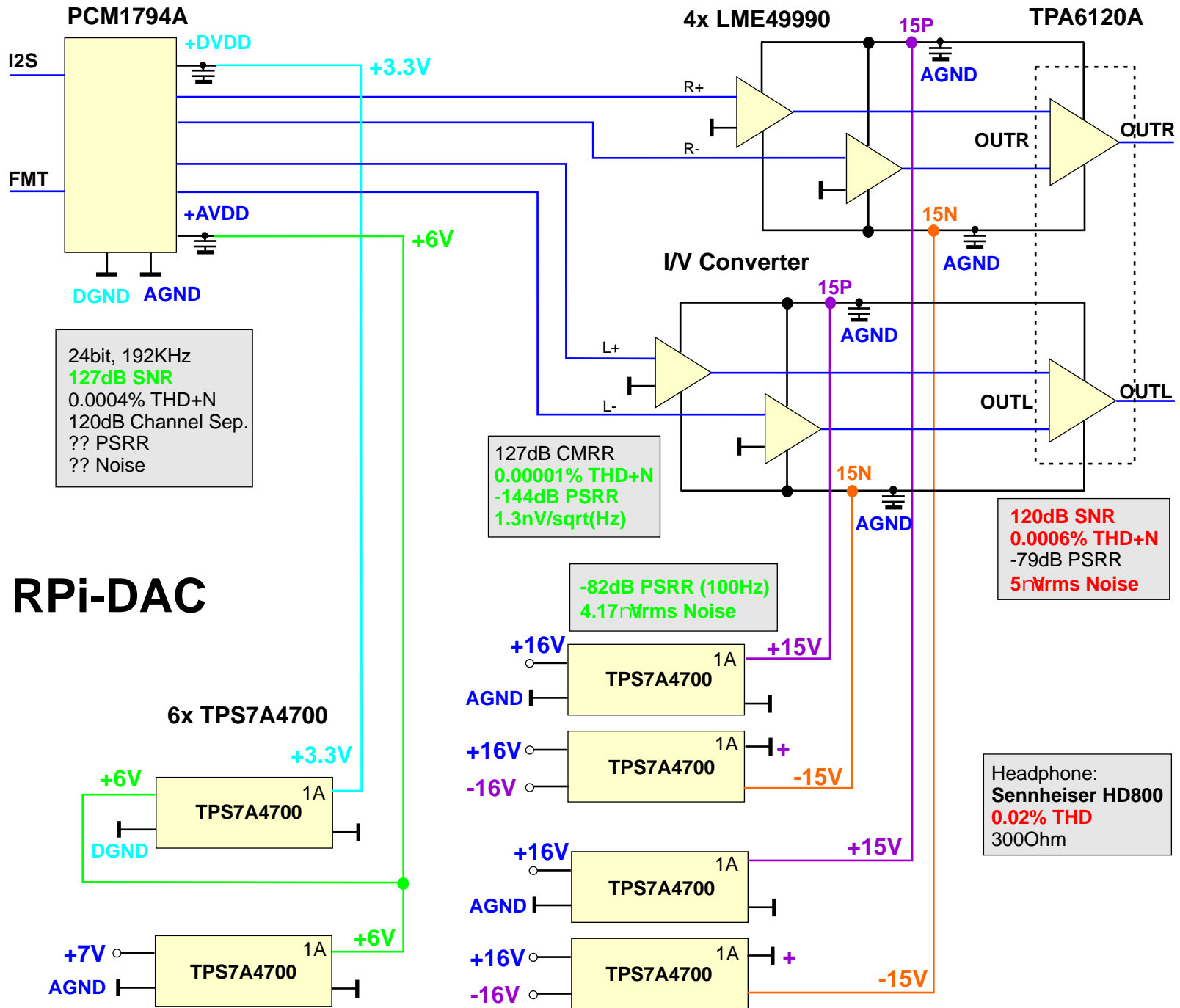
Component	Value	pcs	package	Digikey part	Comments	Price	Sum	0603i=1608m
PCM1794A		1	SMD	296-21537-1-ND	DAC	12.87	12.87	1206i=3216m
TPA6120A2		1	SMD	296-16920-5-ND	AMP	6.05	6.05	
LME49990		4	SMD	LME49990MA-5/NOPB-ND	OpAmp	2.90	11.60	
or:OPA827		4	SMD	296-23816-5-ND	OpAmp	10.13	40.52	JFET for I/V
TPS7A4700		6	QFP	296-34769-1-ND	LDO	5.70	34.20	
Bridge Rectifier	60V, 2A	4	SMD	641-1434-1-ND	BRECT	0.84	3.36	with AC in, instead DC
Headphone Jack	Stereo	1	SMD	CP1-3515SJPICT-ND	3.5mm	1.45	1.45	
Header	1x2	6	through hole	A30786-ND		0.85	5.10	3 of 6 optional for DC rails
Header	1x3	1	through hole	641126-3-ND		0.81	0.81	optional GND
Header, female	2x4	1	through hole	S7107-ND, A106756-ND		0.84	0.84	RPi I2S
Jumper Header	2x3	2	through hole	A26569-ND	or 0R	2.24	4.48	optional, or 0R
Jumper Header	2x2	1	through hole	A106735-ND	or 0R	1.01	1.01	optional, or 0R
Resistor	33R	4	0603	P33ABCT-ND	1.00%	0.10	0.40	
	10K	5		P10KDBCT-ND	0.10%	0.63	3.15	optional with Jumper
	10K	3		985-1278-1-ND	0.10%	0.54	1.62	on DAC, 1x 10K or 8.25K
or:	8.25K	1	0603	985-1277-1-ND	0.10%	0.54	0.54	on DAC, metal film
	1K	4		985-1373-1-ND	0.10%	0.79	3.16	AMP, metal film
	1.5K	4	0603	985-1427-1-ND	0.10%	0.54	2.16	AMP, metal film
	30R	2	0603	985-1428-1-ND	0.10%	0.74	0.22	AMP, metal film
or:	10R	2		P10.0ABCT-ND	1.00%	0.11	0.22	AMP
	825R	4	0603	985-1372-1-ND	0.01%	0.67	2.68	OpAmp, metal film
	0R	10		P541-0.0AGCT-ND	lot of 10x	0.09	0.90	instead jumper
	1.3K	4		P1.3KABCT-ND	1.00%	0.11	0.44	LED R 15V
	130R	1		P130ABCT-ND	1.00%	0.11	0.11	LED R 3.3V
Capacitor	5.6n	4	0603	445-2666-1-ND	5.00%	0.32	1.28	OpAmp, CG0/NPO
	1μ	33	0603	445-7468-1-ND	50V	0.13	4.29	some optional
	47μ	2	1206	445-8047-1-ND	25V	1.05	2.10	on DAC
	47μ	48	1206	445-8047-1-ND	25V	1.05	50.40	some optional
or:	22μ	48	1206	1276-3047-1-ND	25V	0.50	24.00	Or:33μ, instead 47μ
	820μ	9	SMD 12x12	PCE5011CT-ND	25V	1.42	12.78	with AC in and BRECT
Osc.	24.576MHz	1	SMD 4pin	535-12038-1-ND	3.3V	4.88	4.88	optional, no need on Rpi
LED	ye/gr	5		VLMG1300-GS08CT-ND		0.73	3.65	optional

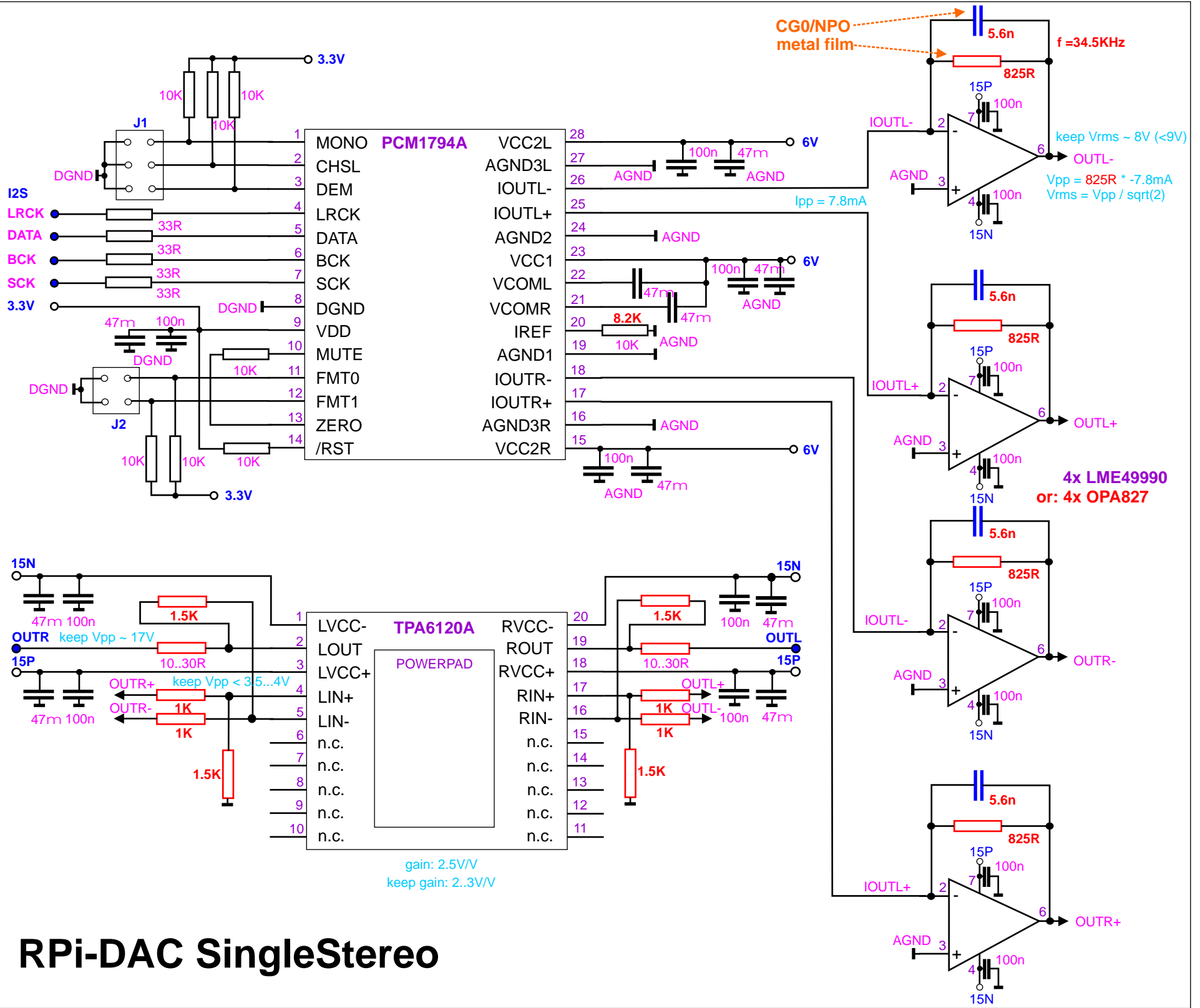
RPi-DAC SingleStereo Top



RPi-DAC SingleStereo Bottom

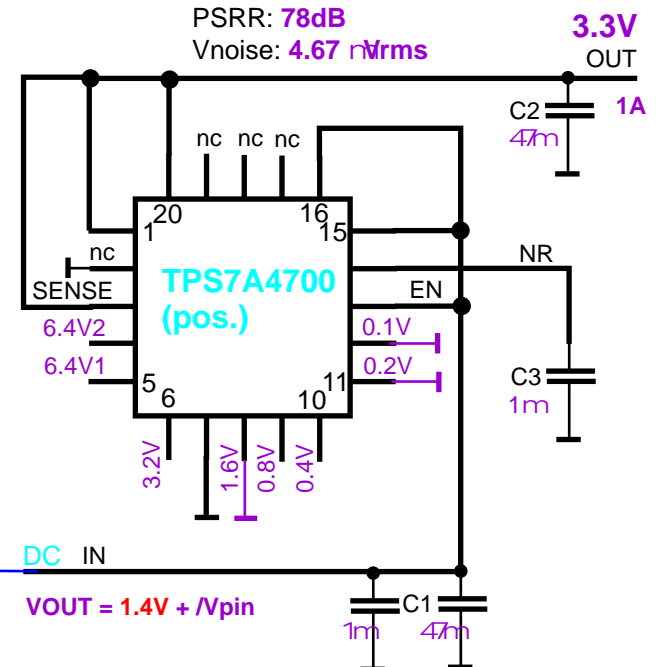
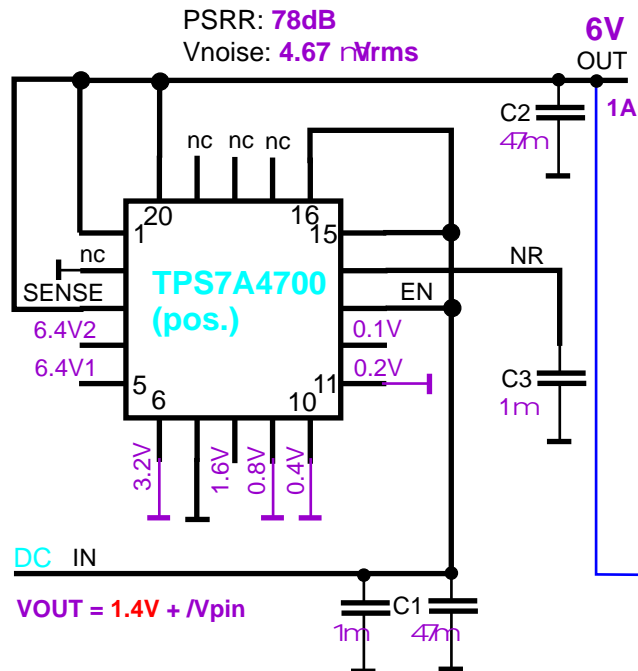
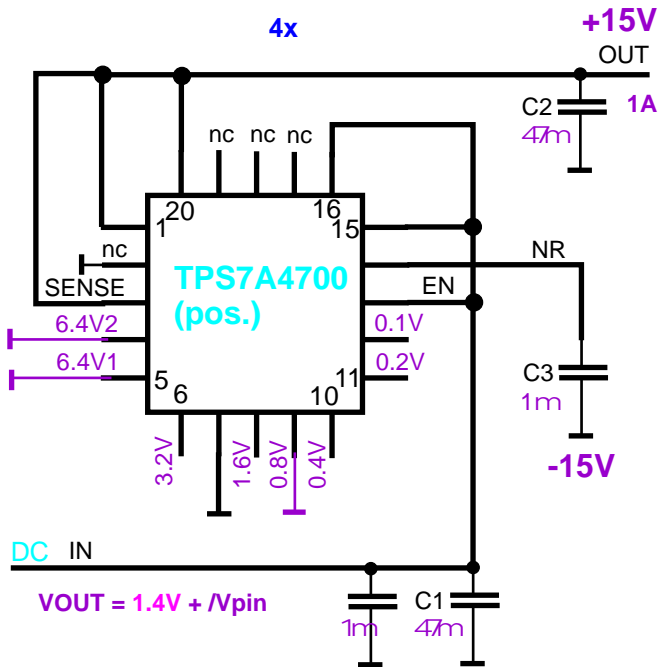




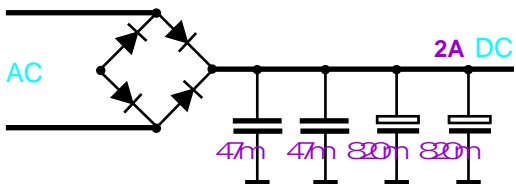


RPi-DAC SingleStereo

PSU (low noise LDOs)



3x separate coils!



6x TPS7A4700 (pos.)

on -15V rail - the GND is used, +15V is grounded!

4x Bridge Rectifier

RPi-DAC SingleStereo Pictures

